PHOTOGRAPHIC INTERPRETATION REPORT

AIR LIQUEFACTION PLANT AND NEARBY FACILITIES TYURATAM MISSILE TEST CENTER USSR

[redacted] 25X1

MAY 1967

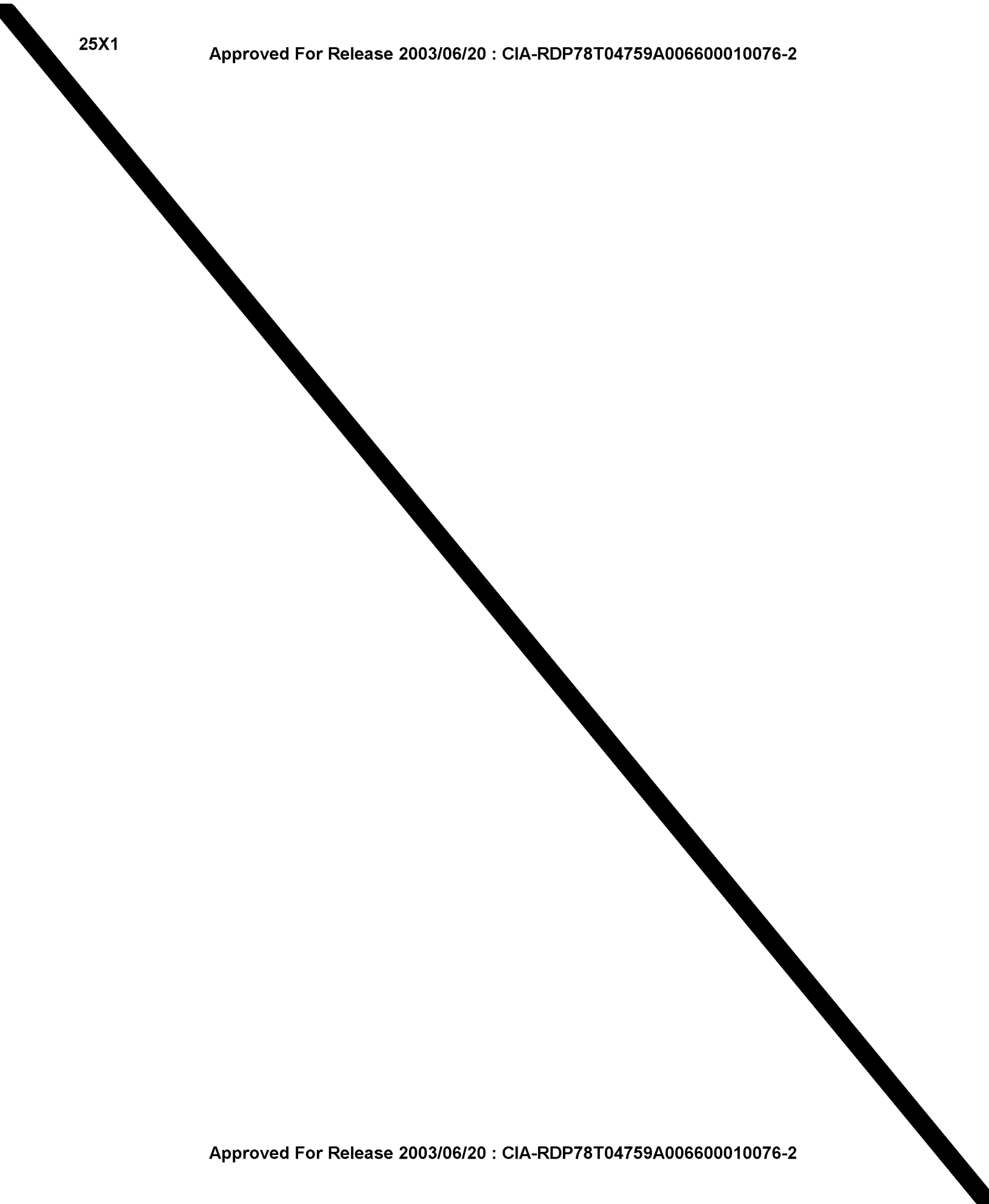
COPY 116

16 PAGES

25X1

[redacted] X1

GROUP 1 EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION



Approved For Release 2003/06/20 : CIA-RDP78T04759A006600010076-2

PHOTOGRAPHIC INTERPRETATION REPORT

AIR LIQUEFACTION PLANT AND NEARBY FACILITIES TYURATAM MISSILE TEST CENTER USSR

MAY 1967

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

Approved For Release 2003/06/20 : CIA-RDP78T04759A006600010076-2

SUMMARY

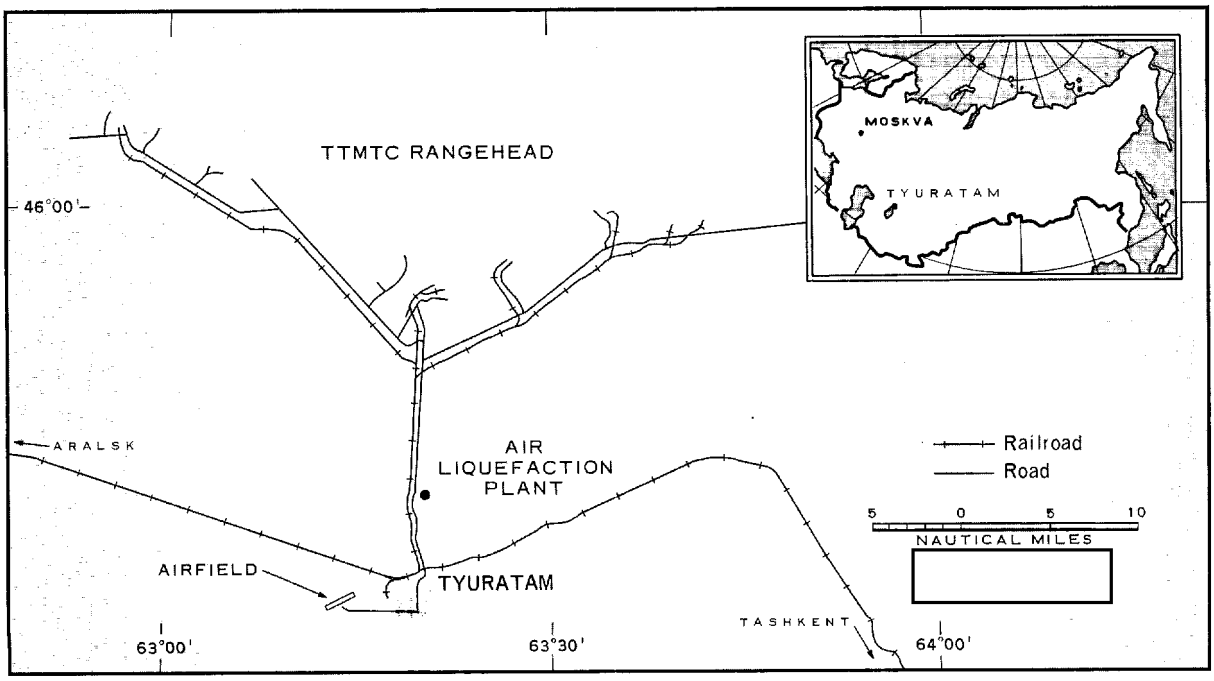
The air liquefaction plant of the Tyuratam Missile Test Center (TTMTC), USSR, consists of a production building that was operational in [redacted] a production building under construction, and associated support, storage, and housing structures. The plant is probably capable of producing both liquid oxygen for use as the oxidizer in a liquid propellant rocket and liquid nitrogen for pressurization and purging operations. A fuel storage area that contains tanks suitable for storing liquid rocket fuel, a large warehouse area, a probable explosives storage area, a high-resolution interferometer facility, and SAM facilities are in the vicinity of the plant.

25X1

INTRODUCTION

The TTMTC air liquefaction plant (BE No [redacted] Tyura Tam LOX Plant), formerly called the TTMTC Propellant Production and Storage Facility, is located at 45-43N 063-19E, adjacent to the rangehead access rail line and approximately 4 nautical miles (nm) north of the village of Tyuratam (Figure 1). The plant is situated near several other facilities that provide support for the test center. These facilities are located around a slight depression, are separately secured, and are served by rail spurs and roads branching from the main transportation route to the rangehead (Figures 2 and 3). Brief descriptions of the nearby facilities are provided in the next section of this report, followed by a chronology of construction of the air liquefaction plant and descriptions of certain significant items contained in that plant.

25X1



25X1

25X1

FIGURE 1. LOCATION MAP.

FIGURE 2. THE TTMTC AIR LIQUEFACTION PLANT AND NEARBY FACILITIES

25X1

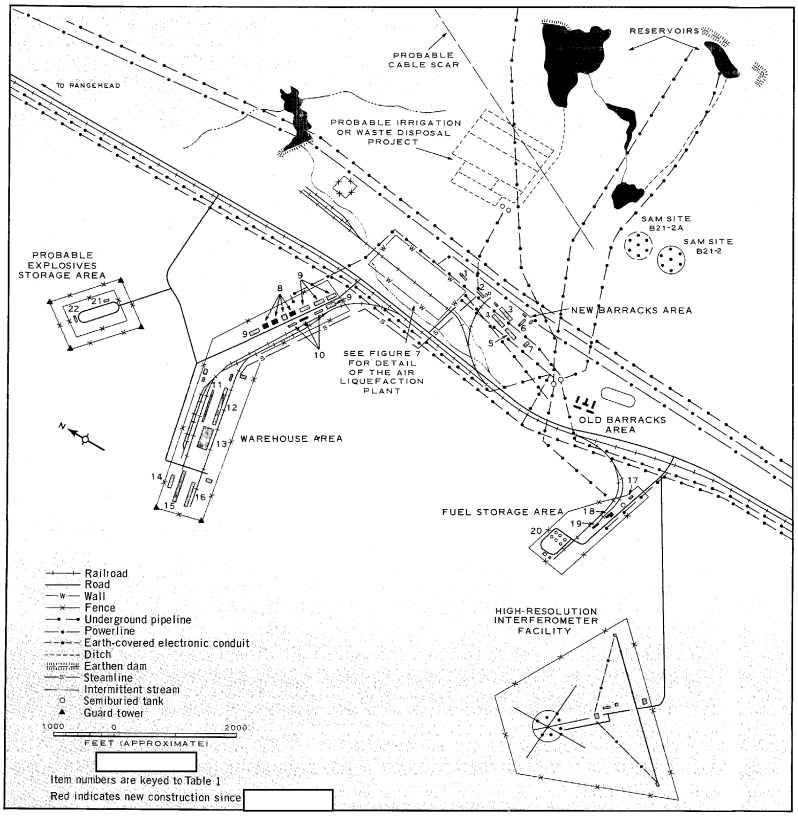


FIGURE 3. FACILITIES NEAR THE TTMTC AIR LIQUEFACTION PLANT.

Table 1. Functions and Dimensions of Structures in Facilities near the TTMTC Air Liquefaction Plant (Item numbers are keyed to Figure 3)

Item	Function/Description	Dimensions* (ft)	Roof Cover (sq ft)
NEW BARRACKS AREA			
1	Vehicle shed		
2	Steamplant		
3	Barracks	250 x 50 x 45h	12,500
4	Barracks	250 x 50 x 45h	12,500
5	Probable admin bldg		
6	Messhall		
7	Support bldg		
WAREHOUSE AREA			
8	Warehouses (4)	100 x 80 x 25h	8,000
9	Warehouses (5)	200 x 60	12,000
10	Warehouses (3)	160 x 60	9,600
11	Warehouse	635 x 60	38,100
12	Warehouse		
13	Warehouse		
14	Warehouse		
15	Warehouse		
16	Warehouse		
FUEL STORAGE AREA			
17	Steamplant	65 x 30	1,950
18	Possible tank car servicing bldg	130 x 60	6,500
19	Possible tank car cleaning bldg	105 x 45	4,725
20	Semiburied tanks (6)	45 diam (approx)	
PROBABLE EXPLOSIVES STORAGE AREA			
21	Probable explosives storage bldg		
22	Probable explosives storage bldg		

*All dimensions are overall and to highest part of structure.

25X1

FACILITIES NEAR THE AIR LIQUEFACTION PLANT

25X1

Facilities near the air liquefaction plant include a large secured warehouse area, a probable explosives storage area, 2 SAM sites, a high-resolution interferometer facility, an old barracks area, a new barracks area, and a secured fuel storage area containing 6 large semibured tanks (Figure 3). Several wells and reservoirs and a probable irrigation or waste disposal project are situated to the east of the air liquefaction plant. A number of powerlines, probable cable scars, and track activity are evident throughout the vicinity. Considerable expansion of the facilities in this area has occurred since

25X1

25X1

25X1

25X1

Indications are seen on recent photography of an increasing need for water used by steamplants and by the cooling compressors of the air liquefaction plant and for human consumption. Water pipelines and water storage tanks present in are probably still in use, and some additional water is probably provided by a pipeline which was first seen under construction on photography of This pipeline extends from the main support base in the village of Tyuratam to the rangehead, passing through the area under consideration. Photography of showed no additional facilities to provide water; since that time, however, an increasing and continuing program of damming small intermittent streams, digging wells, laying underground pipelines, and constructing a probable irrigation or waste disposal project has been evident.

25X1

25X1

25X1

25X1

25X1

25X1

Functional descriptions and dimensions of the more significant buildings and other structures of the facilities near the air liquefaction plant are presented in Table 1, the item numbers of which are keyed to Figure 3.

25X1

Fuel Storage Area

The fuel storage area was in an early stage of construction in and the western portion of the area was probably complete by As seen on photography of the eastern portion contained a steamplant (item 17, Figure 3), a possible tank car servicing building (item 18), a possible tank car cleaning building (item 19), several small structures, and a rail spur serving the area. No security measures were apparent. Effluent stains were visible on photography of Photography of showed early construction for 6 large semiburied tanks (item 20) and a branch rail spur to serve them. These items appeared to be complete by at which time a security fence and loading facilities were also visible.

Warehouse Area

The secured warehouse area was first observed on photography of and has gradually been enlarged to its present dimensions (Figure 3). A particularly large expansion program was evident on photography which showed a western extension of the area where 6 very large warehouses (items 11 through 16) were under construction. These warehouses are presently in use, and there is room for future expansion. The older part of the warehouse area currently contains 12 warehouses (items 8, 9, and 10). Considerable material in open storage is usually visible throughout the entire area. Numerous rail spurs serve the warehouses, and a security fence surrounds the site.

25X1

Probable Explosives Storage Area

A probable explosives storage area was seen under construction immediately north of

25X1 the warehouse area on photography of [redacted]
25X1 [redacted] The area is road served, secured by a double fence, and contains 2 small probable explosives storage buildings (items 21 and 22) situated on a loop road. An earthen revetment is opposite the entrance of each building. The area did not appear to be complete until seen
25X1 on photography of [redacted] Its probable function is storage of small amounts of industrial-type explosives used in construction.

Barracks Areas

A barracks area, including a number of personnel tents and an athletic track, was present in
25X1 [redacted] and is designated the old barracks area (Figure 3). It is located approximately 2,500 feet south of the air liquefaction plant and probably served as housing for construction crews who built the plant. The old barracks area may also billet personnel manning nearby SAM Site B21-2 and an adjacent alternate SAM site.

25X1 Photography of [redacted] showed earth scarring at a site which eventually developed into a new barracks area located adjacent to the southeast corner of the air liquefaction plant (Figures 3 and 5). A new high-standard type of barracks building (item 3) and a messhall (item 6) were seen at this site on photog-
25X1 raphy of [redacted] An oil-burning
25X1 steamplant under construction (item 2) was seen on photography of [redacted] and subsequently extensive ditching for underground water and steam pipelines became apparent. The status of the steamplant, barracks, and
25X1 messhall as of [redacted] is shown on
25X1 Figure 5. By [redacted] the steamplant with its adjacent stack appeared to be complete, and a new rail spur was seen to be serving semi-buried oil storage tanks adjacent to the plant (Figure 6). Currently, the new barracks area contains the steamplant, 2 large completed barracks (items 3 and 4), the messhall, a probable administration building (item 5), a support building which has a small monitor on its roof (item 7), several other small support buildings, and a swimming pool (Figure 6). A vehicle shed (item 1) and a vehicle parking area are nearby.

High-Resolution Interferometer Facility

A newly constructed high-resolution interferometer facility is located approximately 1 nm southwest of the air liquefaction plant (Figure 3). This facility was under construction in [redacted] and appears to be nearing completion. 25X1

AIR LIQUEFACTION PLANT

This last section of this report is in 3 parts: a chronology of the construction of the TTMTC air liquefaction plant, detailed descriptions of the principal facilities of the plant, and a description of LOX-type rail cars serving the plant. The chronology is illustrated by 7 photographs (Figures 4 through 7), the latest of which (Figure 7) is paired with a line drawing on which the principal facilities of the plant are provided with item numbers. In the following discussion of the chronology, frequent reference is made to the numbered items on Figure 7.

Chronology of Construction

The TTMTC air liquefaction plant was first seen in an early stage of construction on photography of [redacted] (Figure 4). 25X1
At that time, the first sections of a production building (items 6a and 6b, Figure 7) were outwardly complete but not operational. The foundations for a cooling rack (item 14) were present, and a steamplant (item 17) was under construction. Two earth-covered water tanks were positioned on a small hill, and a water pipeline trench extended from these tanks to

the production building. A rail spur serving the plant was also under construction.

When next seen years later on photography (Figure 4), the air liquefaction plant was operational as evidenced by completion of the cooling rack and steam-plant. The production building had also been completed, and it had been enlarged by an addition to the high section of the building (item 6c) and by the construction of 2 storage/loading projections (items 6d). A LOX-type rail car was visible on the completed rail spur near the northernmost storage/loading projection. Two administration buildings (items 18 and 19) and a support building (item 3) had been completed, and 2 cryogenic storage buildings (items 4 and 5) were under construction. Trenches for additional water pipelines and a security wall with guard towers at the corners were also evident.

Photography of was of poor interpretability but revealed a new rail yard immediately north of the plant. This rail yard is apparently designed to hold LOX-type rail cars pending use. Two cryogenic storage buildings (items 4 and 5) were also discerned but did not appear to be complete, either in or later when seen on photography. No significant changes were seen on photography of

Photography of (Figure 5) revealed that the cryogenic storage buildings (items 4 and 5) were completed and that they were connected to the storage/loading building projections (items 6d) by an overhead pipeline. This pipeline was very light in tone which probably indicated that it was covered either with reflective insulation or with frost. Being covered with frost would be a normal condition for a cryogenic transfer line in use. The roofs of both the storage/loading projections and the cryogenic storage buildings were covered with a highly reflective material on the photography (Figure 5). This material probably serves to minimize boil off of the stored products. A low work platform had been built between the 2 cryogenic storage buildings, and an overhead cryogenic loading dock had been extended along the rail spurs between the cryogenic storage buildings (items 4 and 5) and the projection building (item 6). Five LOX-type rail cars were seen on the rail spur in this area on the photography. Also visible were a substation, 4 support buildings (items 9, 12, 13, and 16), and an unidentified structure (item 10). A wall was under construction to separate the production area from the northern part of the plant, the latter area being unoccupied at that time except for 2 temporary construction buildings. Three cylindrical tanks, probably used discards, measuring about and 10 feet in diameter were lying scattered on the ground in the northwest corner of the plant.

No significant changes were observed in the plant area in but photography of showed earth scarring in the northern part of the plant at the site of a possible cryogenic storage building (item 2) and 4 LOX-type rail cars alongside the production building (item 6). Photography of showed that the building (item 2) was under construction and that the LOX-type rail cars had been moved. Photography of showed the possible cryogenic storage building (item 2) in final stages of construction and also showed the early stages of construction on a new production building (item 1) in the northern part of the plant. The low section of this building (item 1b) was constructed first.

Photography of (Figure 5) showed continuing construction on the new production building (item 1, Figure 7) and one

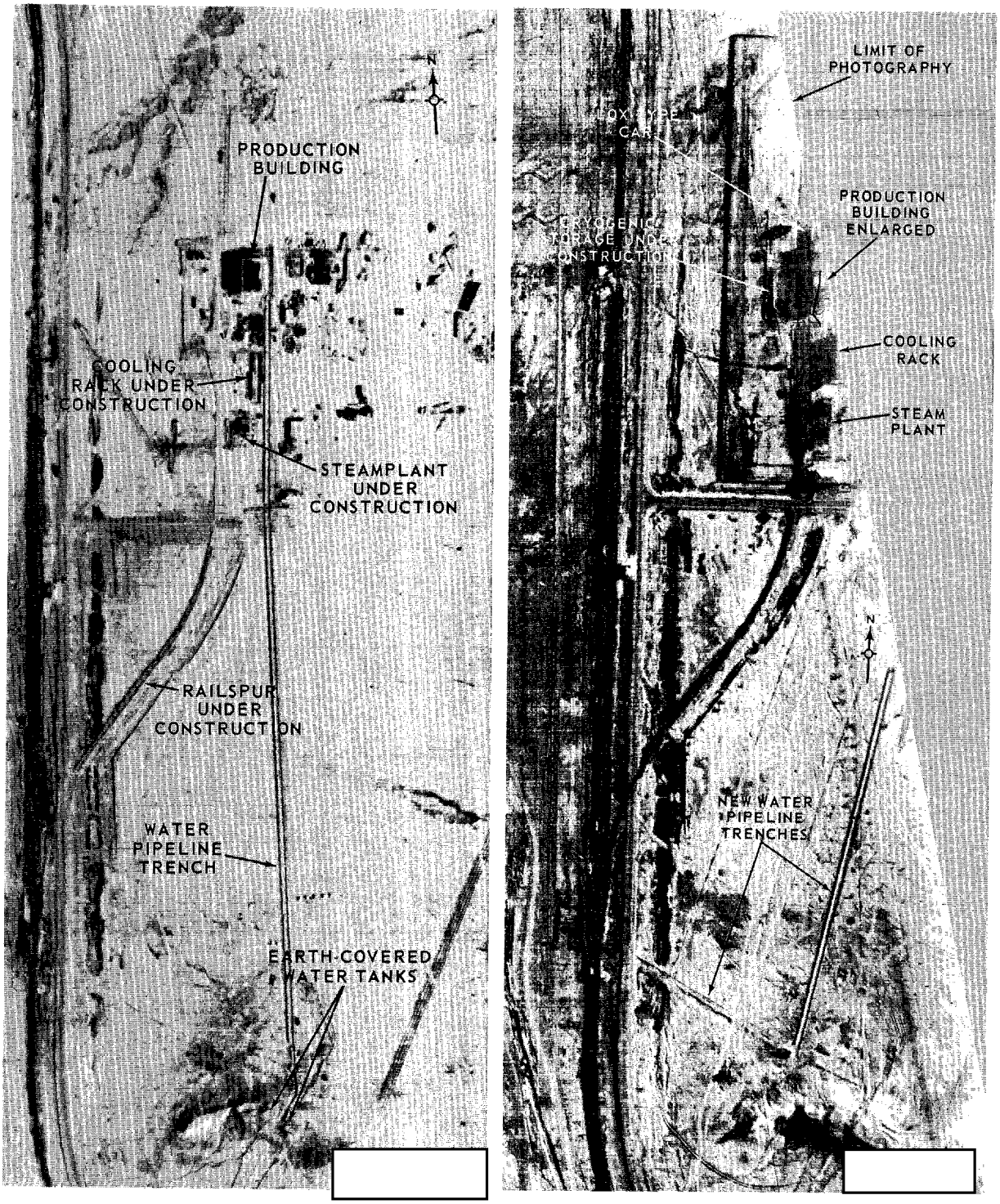
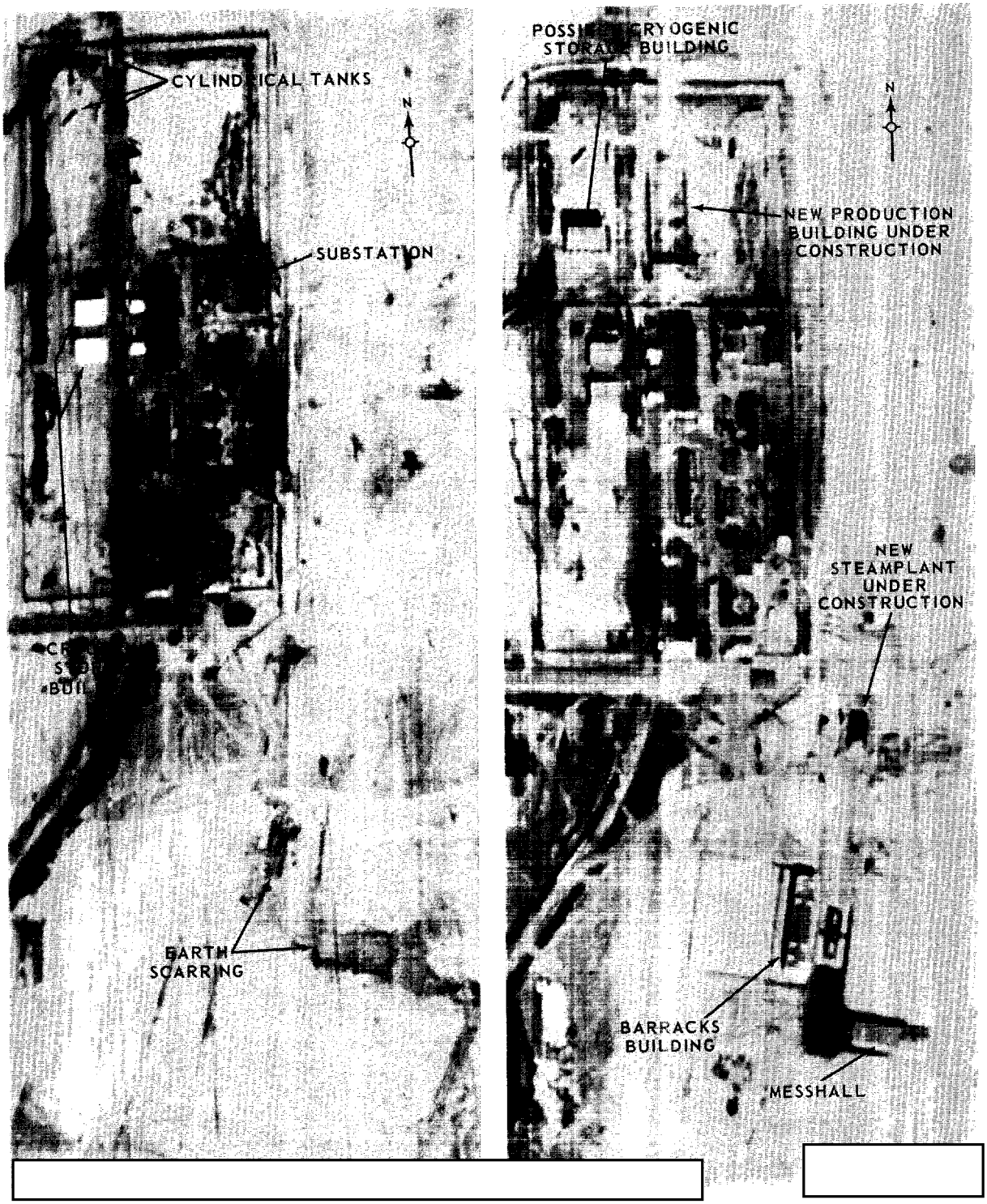


FIGURE 4. THE TTMTC AIR LIQUEFACTION PLANT.



25X1 25X1

FIGURE 5. THE TTMTC AIR LIQUEFACTION PLANT.

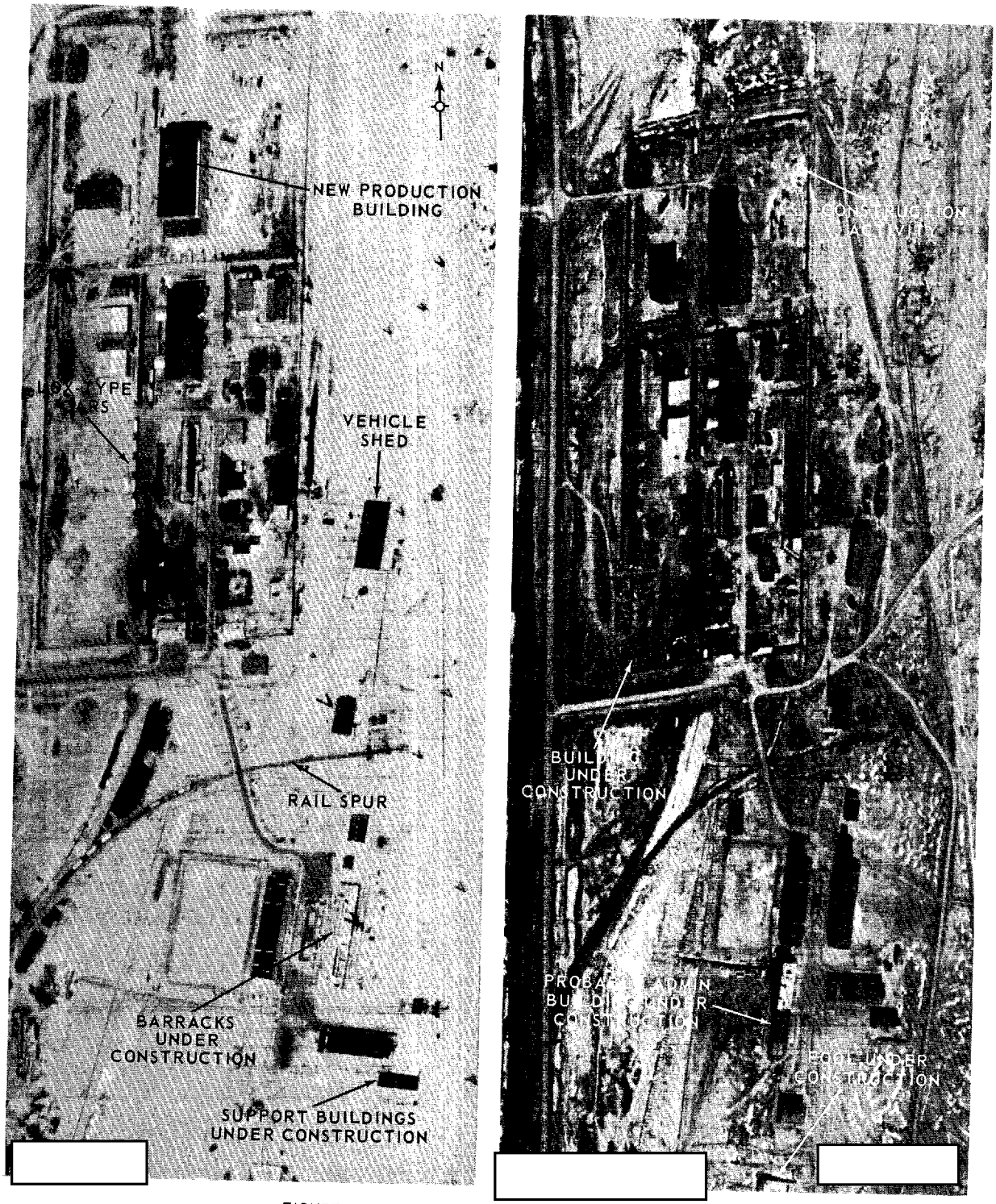


FIGURE 6. THE TTMTC AIR LIQUEFACTION PLANT.

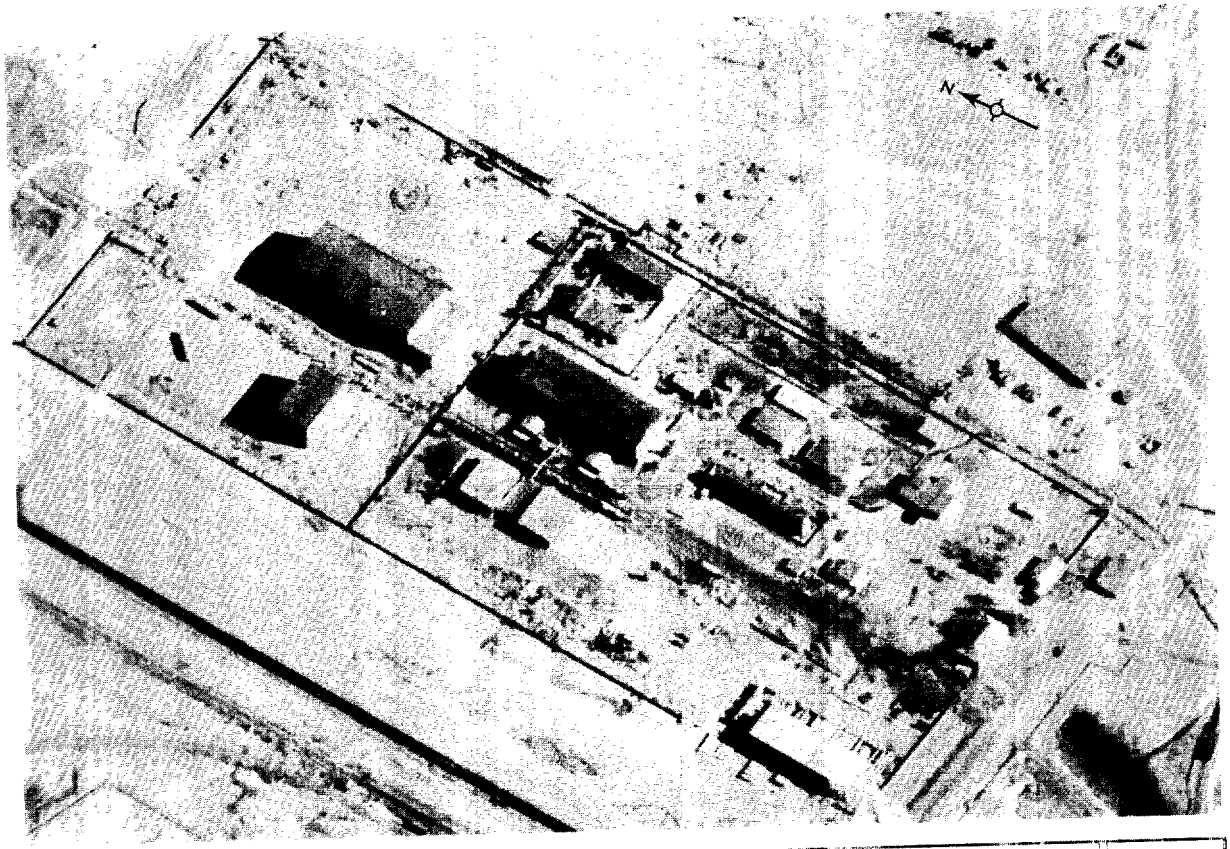


FIGURE 7. LAYOUT OF THE TTMTC AIR LIQUEFACTION PLANT.

Table 2. Functions and Dimensions of Significant Structures in the TTMTC Air Liquefaction Plant (Item numbers are keyed to Figure 7)

Item	Function/Description	Dimensions* (ft)	Roof Cover (sq ft)
1	New production bldg	260 x 100 x 65h	26,000
	a - high section	220 x 100 x 65h	22,000
	b - low section	100 x 40 x 35h	4,000
2	Possible cryogenic storage bldg	125 x 60 x 50h	7,500
	a - high section		
	b - low section		
3	Support bldg	40 x 20 x 15h	800
4	Cryogenic storage bldg		
5	Cryogenic storage bldg		
6	Original production bldg	250 x 75 x 60h	20,275
	a - low section		
	b - high section, older part	125 x 75 x 60h	9,375
	c - high section, newer part		
	b&c- total high section		
	d - storage and loading projections (2)		
7	Possible emergency generator bldg		
8	Transformer bldg		
9	Support bldg	40 x 25	1,000
10	Unidentified structure	30 x 30	900
11	Support bldg	60 x 40	2,400
12	Support bldg	60 x 40	2,400
13	Support bldg	70 x 40	2,800
14	Cooling rack		
15	Support bldg	35 x 35	1,225
16	Probable vehicle shed	75 x 75	4,050
17	Steamplant		
18	Admin bldg		
19	Admin bldg		
20	Bldg under construction		
	roofed portion		
	entire foundation		

*All dimensions are overall and to highest part of structure.
**Estimated height.

new support building (item 15). The new steamplant (item 2, Figure 3) was under construction outside the plant area near the newly constructed high-standard barracks and messhall (items 3 and 6, Figure 3).

Photography of [redacted] (Figure 6) showed that the new production building (item 1) was outwardly nearing completion, that a new support building (item 11) had been constructed, and that 8 LOX-type rail cars were in the plant area. Four additional LOX-type rail cars and 9 other tank/rail cars were on the rail spurs south of the plant. A vehicle shed (item 1, Figure 3) and 2 small support buildings had been constructed outside the plant area, and a new high-standard barracks (item 4, Figure 3) was under construction. The new oil-burning steamplant (item 2, Figure 3) was probably operational.

Photography of [redacted] (Figure 6) showed little change in the plant area. Continuing construction activity was evident near the new production building (item 1, Figure 7) and a large new building (item 20) was under construction in the southwest corner of the plant. A probable administration building (item 5, Figure 3) and a swimming pool were under construction in the new barracks area outside the southeast corner of the plant. Eleven LOX-type rail cars were

25X1 seen in the plant area on photography of [redacted] but only one was present on [redacted] (Figure 6). No significant change in the plant was seen on [redacted] photography.

The best photographic coverage of the plant to date was obtained in [redacted] (Figure 7). As seen on this photography, the new production building (item 1) had not changed since [redacted] and it apparently was not operational since no loading facilities had been constructed. The foundations for a possible tank were evident east of the building, but little other nearby activity was evident. The possible cryogenic storage building (item 2) had not changed since [redacted] The building under construction in the southwest corner of the plant (item 20) was partially roofed, and immediately west of this building were 19 cylindrical tanks approximately 20 feet long and 5 feet in diameter, lying in rows on the ground. Five LOX-type rail cars were in the plant area.

Photography of [redacted] shows continuing construction on the building in the southwest corner of the plant (item 20). The new production building (item 1) was apparently not yet operational.

Description of Significant Structures

Functional descriptions and dimensions of the principal structures included within the walls of the air liquefaction plant are presented in Table 2 which is keyed to the numbered items of the line drawing on Figure 7.

The original production building (item 6) has a high section (items 6b and 6c) [redacted] long, 75 feet wide, and 60 feet high. (For overall dimensions, see Table 1.) There are 14 circular vents on the roof of the high section; the vents on the older northern portion (item 6b) are closer together than on the newer southern portion. Two small, low protuberances on the east side of the building are probably air intakes and filters. Both sides of the building contain rows of tall windows.

In an air liquefaction plant, compressors and fractionating equipment would be contained in the high section of the production building, and the products would be both liquid oxygen (LOX) and liquid nitrogen (LN_2). Immediately before loading, the LOX/LN_2 is probably stored in relatively small quantities in the small storage/loading projections (items 6d) which are probably shed roofs covering storage tanks. Overhead pipelines from the storage and loading projections join to form a single overhead pipeline that serves both the loading dock and the 2 cryogenic storage buildings (items 4 and 5). The low section of the main part of the production building probably contains maintenance and administration offices and equipment.

The cryogenic storage buildings (items 4 and 5) provide additional storage capacity for large quantities of cryogenics when needed. These buildings are only about 20 feet high, and it is possible that they are shed structures covering horizontal cylindrical tanks.

The loading dock consists of an overhead pipeline supported by 13 struts. It is parallel to the rail spurs and permits the simultaneous loading of a number of LOX-type rail cars. The cooling rack (item 14) and the substation provide cooling and power for the compressors in the production building (item 6).

The new production building (item 1) is slightly larger but otherwise quite similar to the main part of the original production building. It consists of a large high section (item 1a) and a smaller low section (item 1b). Its ventilating system differs from that of the original production building, consisting of 6 low ventilators on the roof and 3 tall ventilators on

the east side of the building which is also the location of 3 air intakes. No loading facilities are evident. Currently, the new production building is in the final stages of construction, but there appears to have been a halt or interruption of the construction since [redacted] Its associated possible cryogenic storage building (item 2) is in the same relative position as the 2 cryogenic storage buildings are to the original production building, but there is no apparent pipeline connection.

The function of the large structure under construction (item 20) in the southwest corner of the plant is unidentified, but the structure may be intended to serve as a storage building.

LOX-type Rail Cars

The LOX-type rail cars seen from time to time in and near the air liquefaction plant are [redacted] and have a container section [redacted] feet long centered on their overall length of [redacted] feet. The container section usually appears very light in tone on photography. The interpretability of the photography does not permit their identification as the known Soviet LOX rail cars which have a unique beveled configuration, and there is no visible protrusion usually found in the center of tank cars. It is, therefore, concluded that they are insulated rail cars covered with a reflective material and suitable for transporting either LOX or LN_2.

REFERENCES

[redacted]

REFERENCES (Continued)

25X1

MAP OR CHARTS

US Air Target Chart, Series 200, Sheet 0246-13

REQUIREMENT

GMAIC. 20-6

NPIC PROJECT

11203/66